

# Hydropower Projects in Nepal



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# Nepal in Region



# Country Profile

- **Area** : **147,181 km<sup>2</sup>**
- **Population** : **2,32,14,681 (2001)**
- **GDP** : **5.9 B US\$ (2003)**
- **Average annual flow** : **225 Billion CM**
- **Theoretical generation capacity** : **83,000 MW**
- **Economically feasible capacity** : **44,000 MW**
- **Present installed capacity (hydro)** : **590 MW**

# Major River Basins and Hydropower Projects in Nepal

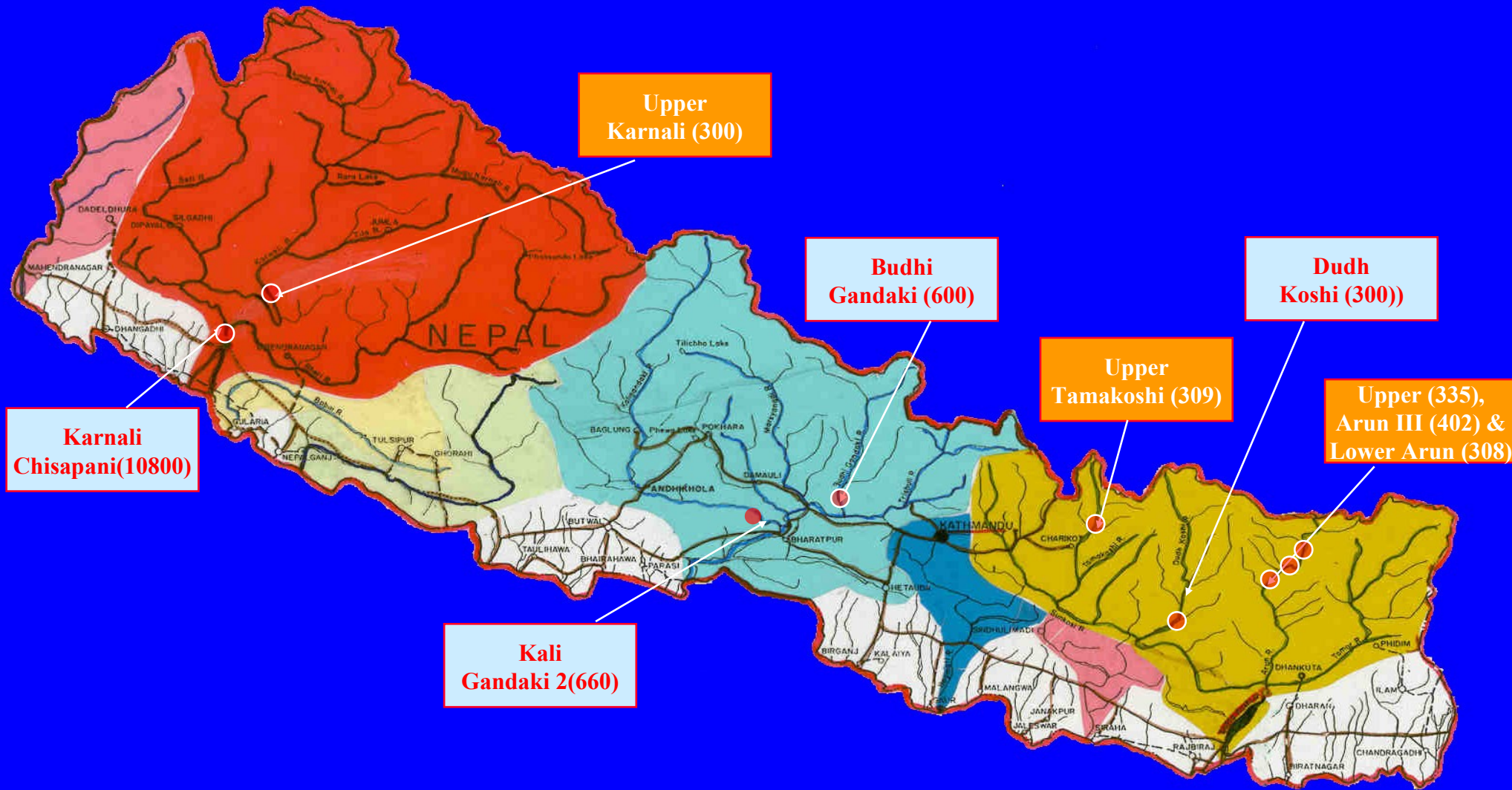




# Private Sector Projects

<u>SNProject (MW)</u>	<u>Promoter</u>	<u>Status</u>
1. Upper Bhote	Khimti-1 (60)	HPL Completed
2. Indrawati-3 (7.5)	Completed NHPC	Koshi (36) BKPC Completed
3. Chilime (20)	Chilime (20)	CPC Completed
4. Piluwa (3)	AVHDC	Completed
5. Syange (0.18)	LEDCO	Completed
6. Sunkoshi (2.6)	SHPL	Completed
7. Chaku (1.5)	APN	Completed

# Hydropower Projects : Nepal



# Project Features : Lower Arun

## Location

**Region :** Eastern Development

**District :** Sankhuwasabha

**Type :** Run-of-River (Daily Pondage)

**Installed Capacity :** 308 MW ( 4x77 MW )

**Net Rated Head :** 212.2 m

**Design discharge :** 171.5 m<sup>3</sup>/Sec

**Weir Height :** 10.5 m

**Power House Type :** Underground

**Power Tunnel Length & Dia :** 15.2 km / 8.4m

**Average Annual Energy :** 2275.9 GWh

**Firm Energy :** 1436.5 GWh

**Access Road Length :** 25 km from Arun-3 damsite

**Transmission Length :** 100 km (220 kV)

**Project Cost :** US\$ 481.4 million (1990)

**Status:** Pre-Feasibility Study, 1990

# Project Features : Arun 3

<b>Location</b>		<b>Eastern Development</b>
<b>Region</b>	:	<b>Sankhuwasabha</b>
<b>District</b>	:	<b>Pondage Run-of-River</b>
<b>Type</b>	:	<b>402 MW ( 6 x 67 MW )</b>
<b>Installed Capacity</b>	:	<b>303.8 m</b>
<b>Gross Head</b>	:	<b>320 m<sup>3</sup>/sec</b>
<b>Design Discharge</b>	:	<b>68 m</b>
<b>Dam Height</b>	:	<b>Underground</b>
<b>Power House Type</b>	:	<b>Underground</b>
<b>Desander Type</b>	:	<b>11.5 km/7.5 m</b>
<b>Tunnel Length &amp; Dia.</b>	:	<b>2891 GWh</b>
<b>Average Annual Energy</b>	:	<b>1558 GWh</b>
<b>Firm Energy</b>	:	<b>116.8 km</b>
<b>Access Road Length</b>	:	<b>432.2 km(220 kV double crt.)</b>
<b>Transmission Length</b>	:	<b>US\$ 859.09 million (1995)</b>
<b>Project Cost</b>	:	
<b>Status:</b>	<b>Detailed Design Study</b>	

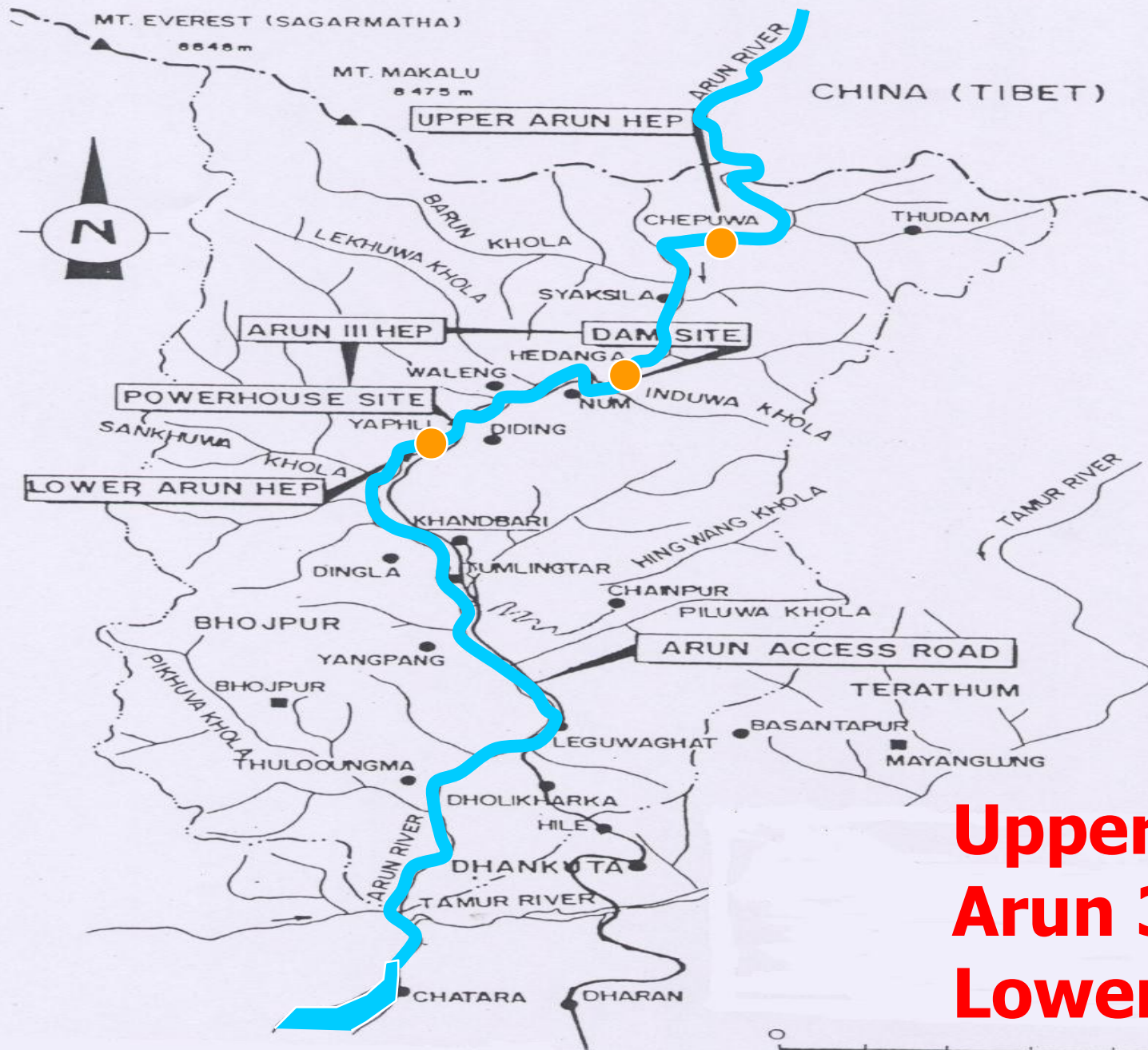


# Project Features : Upper Arun

## Location

Region	:	Eastern Development
District	:	Sankhuwasabha
Type	:	Run-of-River (Daily Pondage)
Installed Capacity	:	335 MW ( 4 x 83.75 )
Net rated Head	:	492 m
Dam Height	:	37 m
Design Discharge	:	78 m <sup>3</sup> /Sec
Power House Type	:	Underground
Tunnel Length & Size	:	7.84 km & 5.5 m
Average Annual Energy	:	2050 GWh
Access Road Length	:	45 km from Arun-3 damsite
Transmission Length	:	200 km (220 kv)
Project Cost	:	US\$ 508.8 million (1991)

**Status:** Feasibility Study, 1991



**Upper Arun**  
**Arun 3**  
**Lower Arun**

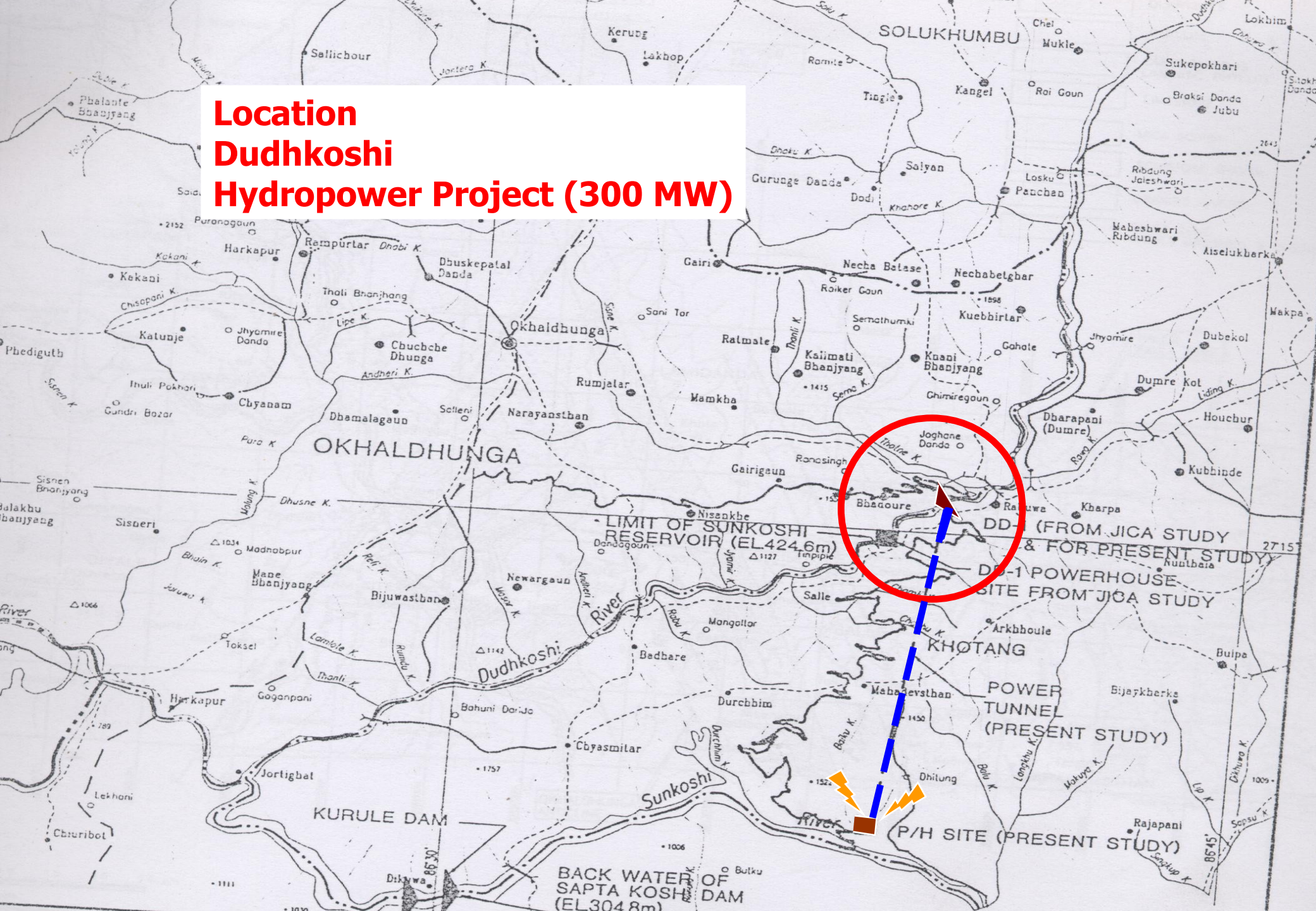
# Project Features : Dudh Koshi

## Location

Region	:	Eastern Development
District	:	Okhaldunga, Khotang
Type	:	Storage
Installed Capacity	:	300 MW (5x60 MW)
Net Rated Head	:	249.3 m
Design Discharge	:	136 m <sup>3</sup> /s
Dam Height	:	180 m
Live Storage	:	442.1 million cubic metre
Power House Type	:	Underground
Average Annual Energy	:	1806 GWh
On Peak Firm Energy	:	552 GWh
Off Peak Firm Energy	:	920 GWh
Access Road Length	:	43.2 km
Transmission Length	:	93 km (220kv Duple crt.) 135 km (220 kv Single crt.)
Project Cost	:	US\$ 690.1 million (1998)
Status:	Feasibility Study, 1998	



# Location Dudhkoshi Hydropower Project (300 MW)





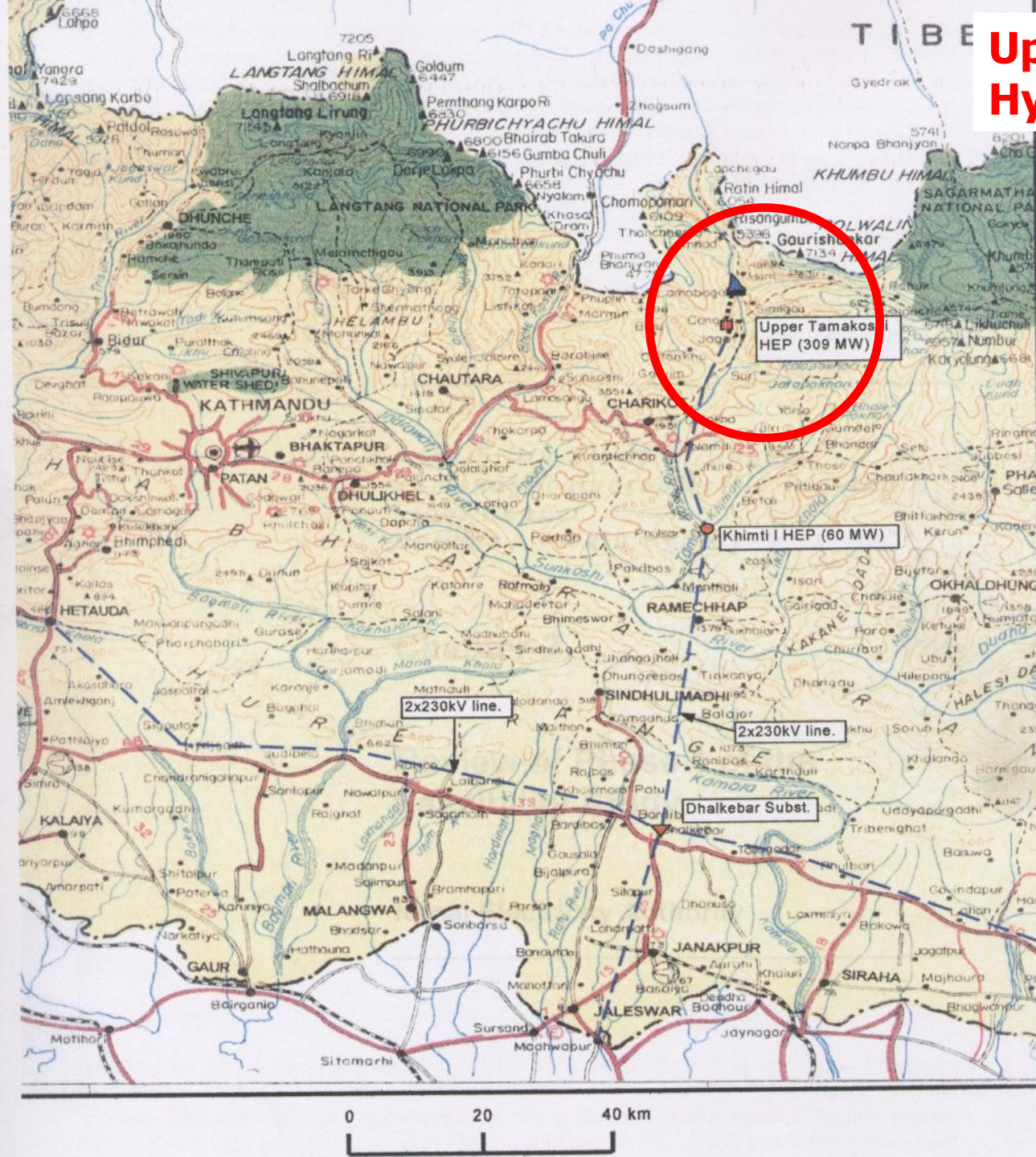
# Project Features : Upper Tamakoshi

## Location

Region	:	Eastern Region
District	:	Dolakha
Type	:	PROR
Installed Capacity	:	309 MW
Net Rated Head	:	820 m
Design Discharge	:	44 m <sup>3</sup> /Sec
Dam Height	:	177 m
Power House Type	:	Surface
Tunnel Length	:	7170 m
Average Annual Energy	:	3470 GWh
Access Road Length	:	61 km
Transmission Length	:	47 km (220 kV)
Project Cost	:	US\$ 340 million (2005)

**Status:**      **Feasibility Study, 2005**

# Upper Tamakoshi Hydropower Project (309 MW)



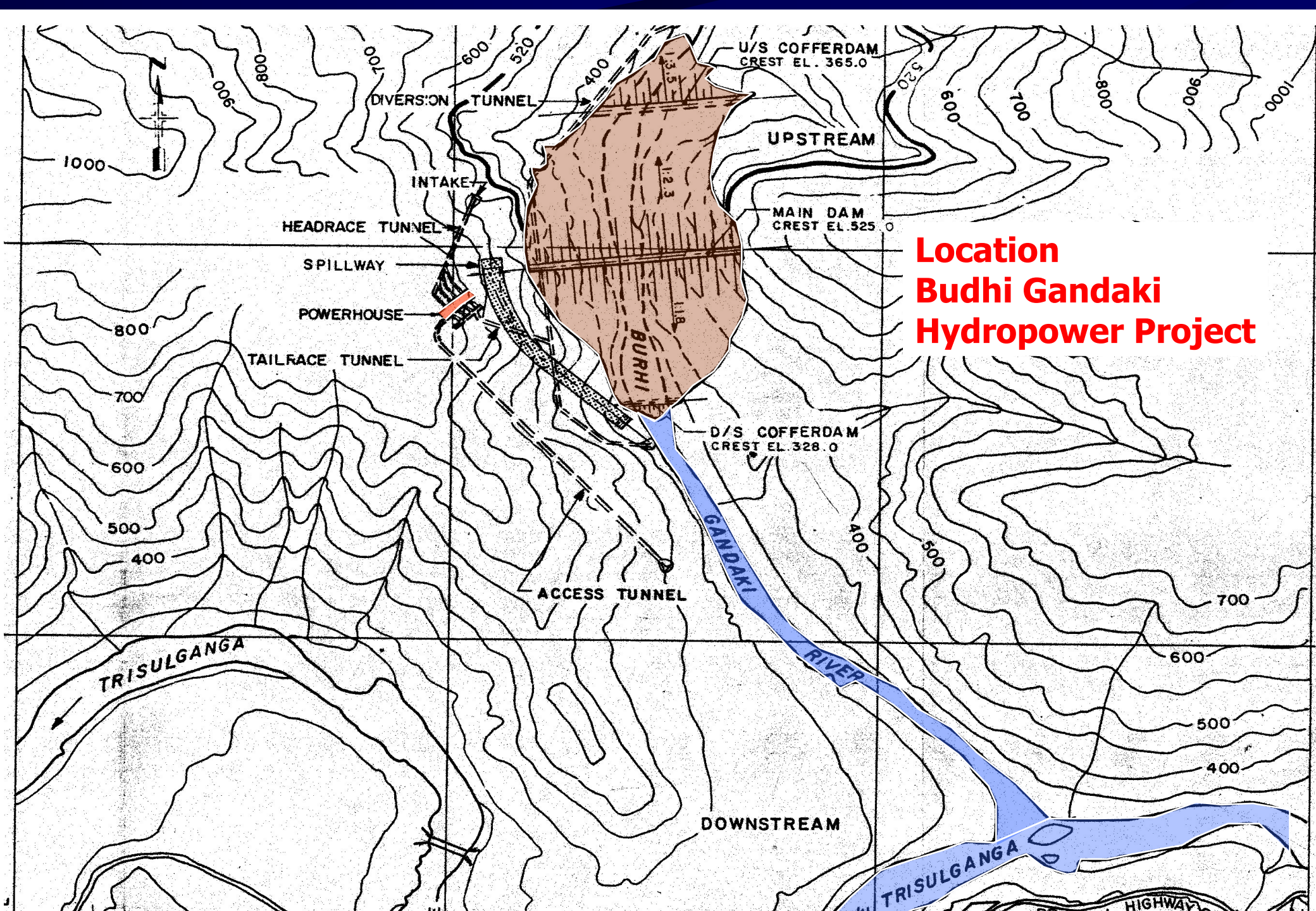
# Project Features : Budhi Gandaki

## Location

Region	:	Central/Western Development
District	:	Dhadhing/Gorkha
Type	:	Storage
Installed Capacity	:	600 MW ( 4 x150 MW )
Net Head	:	185 m
Design Discharge	:	430 m <sup>3</sup> /s
Dam Height	:	225 m
Live storage	:	2755 million cubic meter
Dam Type	:	Rockfill with inclined core
Power House Type	:	Underground
Tunnel Length & Dia	:	276 m /12m
Average Annual Energy	:	2495 GWh
Access Road Length	:	2.5 km
Transmission Length	:	65 km (220 kv)
Project Cost	:	US\$ 774 million (1983)

**Status:** Pre-Feasibility Study, 1984





**Location  
Budhi Gandaki  
Hydropower Project**

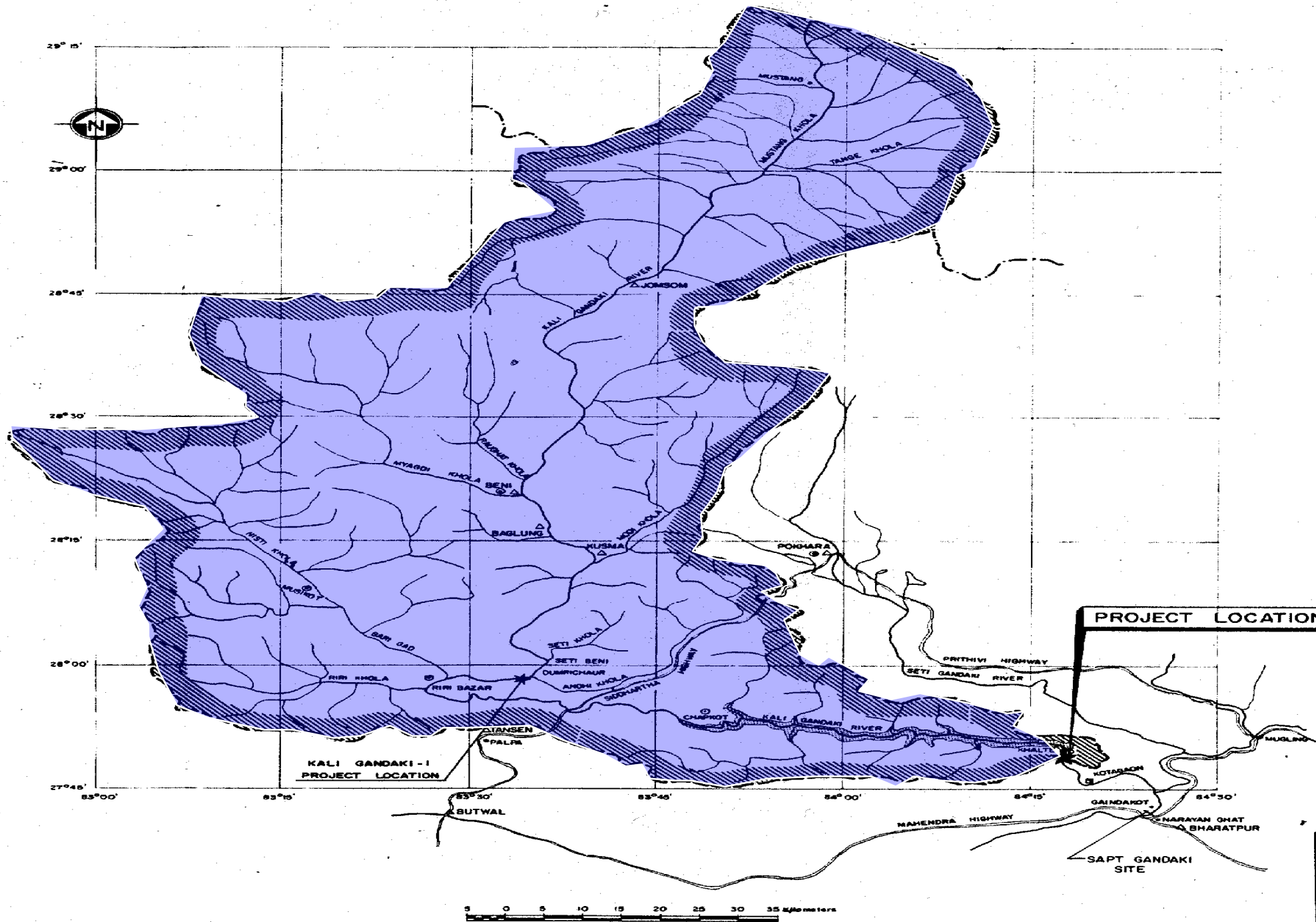


# Project Features : Kali Gandaki 2

## Location

Region	:	Western Region
District	:	Nawalparasi and Tanahu
Type	:	Storage
Installed Capacity	:	660 MW (6 x 110 MW)
Net Rated Head	:	128.3 m
Design Discharge	:	585 m <sup>3</sup> /Sec
Dam Height	:	177 m
Power House Type	:	Surface
Tunnel Length & Dia	:	322 m /6 m
Average Annual Energy	:	3470 GWh
Access Road Length	:	20 km
Transmission Length	:	40 km (220 kv)
Project Cost	:	US\$ 772 million (1985)

**Status:** Pre-Feasibility Study, 1985

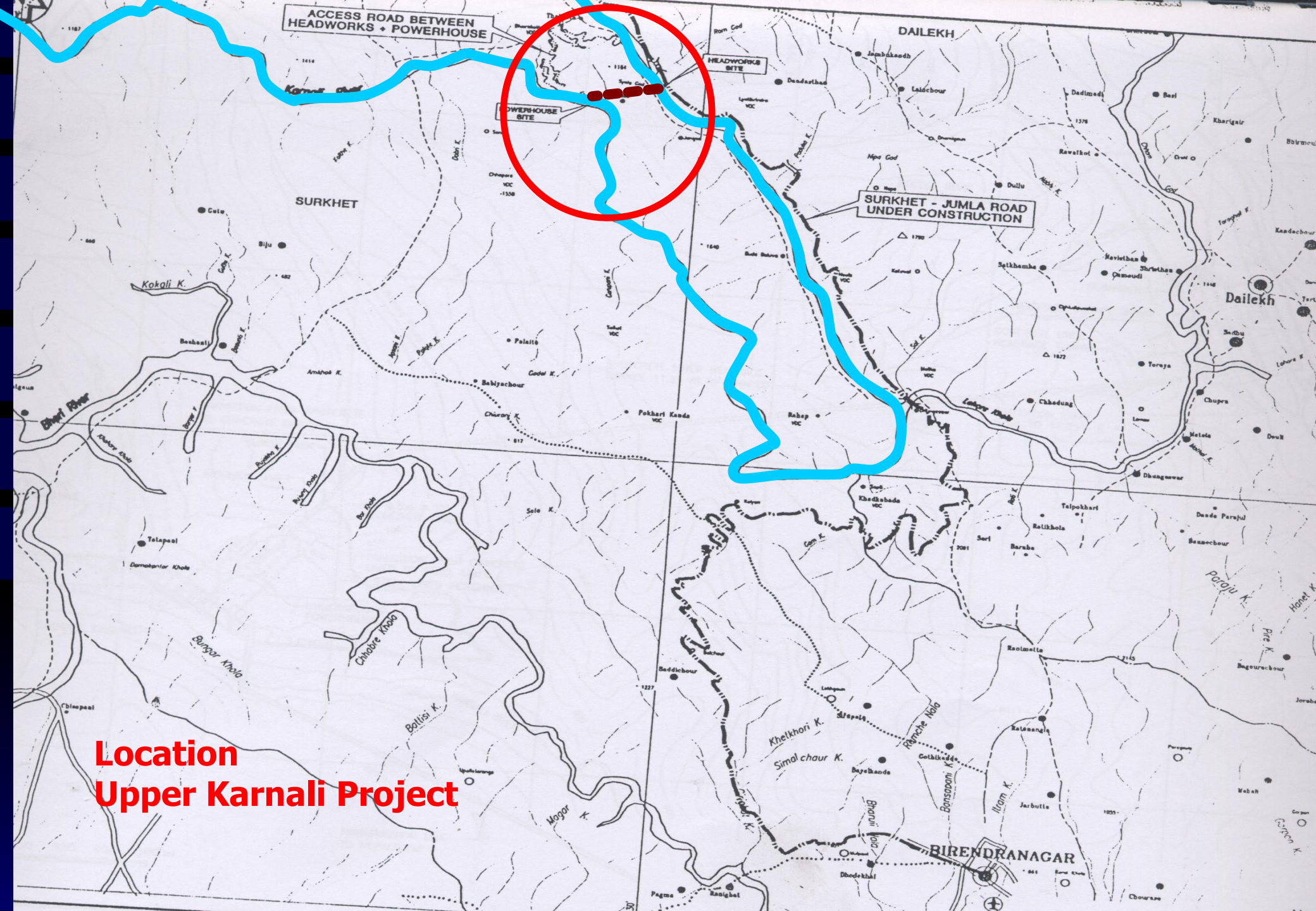


# Project Features : Upper Karnali

<b>Location</b>	<b>:</b>	<b>Mid/Far Western Region</b>
<b>Type</b>	<b>:</b>	<b>Run-of-River (Pondage)</b>
<b>Installed Capacity</b>	<b>:</b>	<b>300 MW</b>
<b>Gross Head</b>	<b>:</b>	<b>141 m</b>
<b>Design Discharge</b>	<b>:</b>	<b>236 m<sup>3</sup>/s</b>
<b>Weir Height</b>		<b>27 m</b>
<b>Power House Type</b>	<b>:</b>	<b>Underground</b>
<b>Desander Type</b>	<b>:</b>	<b>Surface</b>
<b>Tunnel Length &amp; Dia.</b>	<b>:</b>	<b>2.2 km &amp; 11.35 m</b>
<b>Average Annual Energy</b>	<b>:</b>	<b>1915 GWh</b>
<b>Firm Energy</b>	<b>:</b>	<b>1159 GWh</b>
<b>Access Road Length</b>	<b>:</b>	<b>22 km</b>
<b>Transmission Length</b>	<b>:</b>	<b>215 km (220 kv)</b>
<b>Project Cost</b>	<b>:</b>	<b>US\$ 454.3 million (1998)</b>

**Status:**                      **Feasibility Study 1998**





**Location  
Upper Karnali Project**



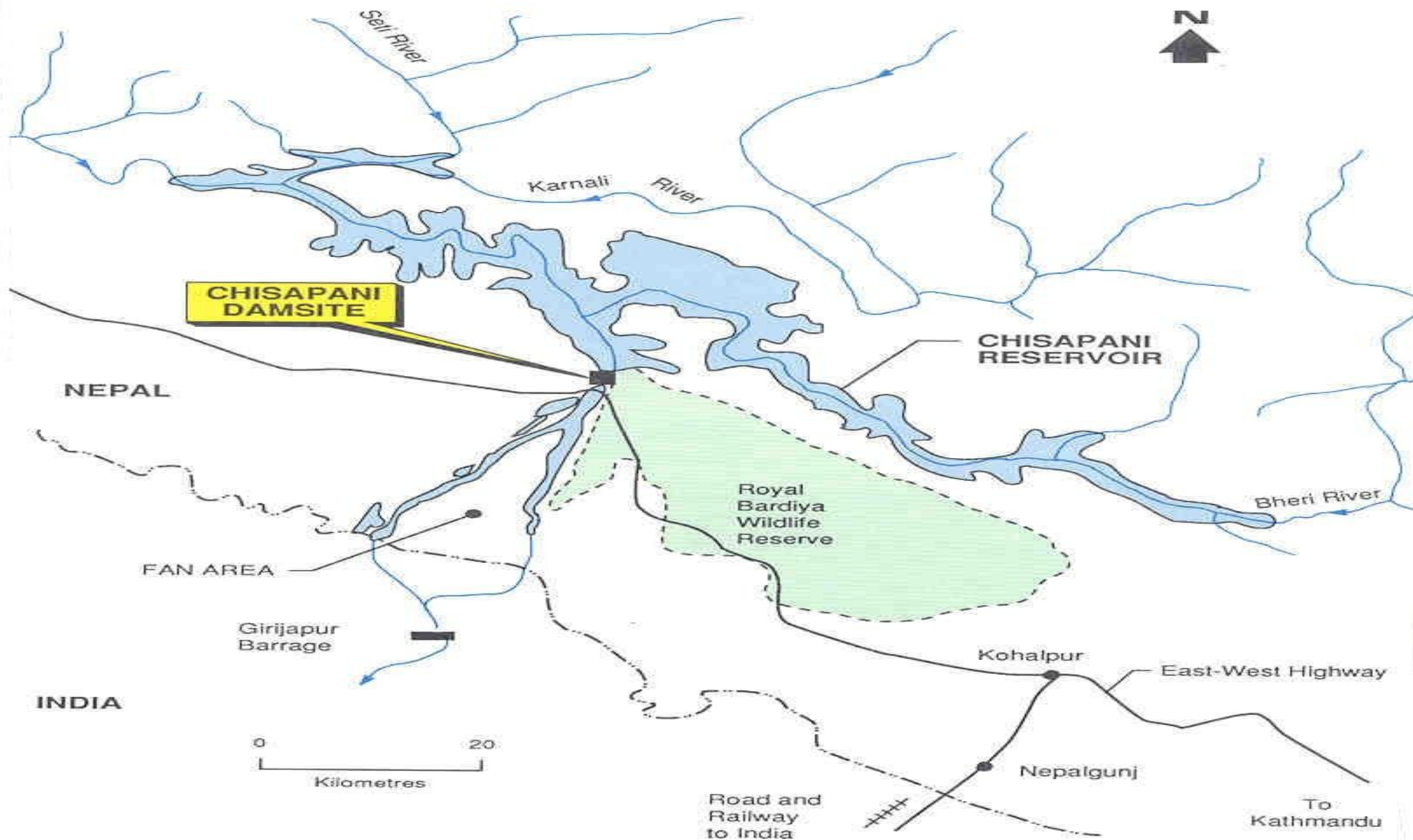
# Project Features : Karnali (Chisapani)

## Location

Region	:	Mid-Western Development
District	:	Bardiya/Achham
Type	:	Storage
Installed Capacity	:	10800 MW ( 18 x600 MW )

Average Discharge	:	1390 m <sup>3</sup> /s
Dam Height	:	270 m
Live storage	:	16.2 billion cubic meter
Dam Type	:	Rockfill with inclined core
Power House Type	:	Underground
Tunnel Length & Dia	:	276 m /12m
Average Annual Energy	:	20842 GWh
Access Road Length	:	2.5 km
Transmission Length	:	300 km (765 kV to India)
Project Cost	:	US\$ 4890 million (1989)

Status: Pre-Feasibility Study, 1984



## Karnali (Chisapani) Multipurpose Project



Thank You